

Mathematical Sciences and Economics, B.S.

The B.S. in Mathematical Sciences and Economics is an interdisciplinary major that provides students with courses that complement and develop depth of understanding of economic theory, applied economics, and applied mathematics. The major equips students with the mathematical tools that are essential for success in Ph.D. programs in economics, mathematics, and key functional areas of business including finance, accounting, marketing, and information systems. Students must be enrolled in a B.S. in Mathematical Sciences to apply for the Mathematical Sciences and Economics major.

Acceptance into the major is based on meeting the following requirements:

- Cumulative QPA of at least 3.
- Earned a "B" or better in 21-127 Concepts of Mathematics or 21-128 Mathematical Concepts and Proofs
- Earned a "B" or better in 21-241 Matrices and Linear Transformations
- Completed Principles of Microeconomics waiver, 73-102 Principles of Microeconomics or 73-104 Principles of Microeconomics Accelerated
- Earned a "B" or better in 73-103 Principles of Macroeconomics
- Earned a "B" or better in either 73-230 Intermediate Microeconomics or 73-240 Intermediate Macroeconomics
- Personal statement

Economic Theory Requirements

73-102	Principles of Microeconomics	Units
or 73-104	Principles of Microeconomics Accelerated	9
73-103	Principles of Macroeconomics	9
73-230	Intermediate Microeconomics	9
73-240	Intermediate Macroeconomics	9

Quantitative Analysis Requirements

70-207	Probability and Statistics for Business Applications	Units
or 36-200	Reasoning with Data	9
36-225	Introduction to Probability Theory	9
or 36-235	Probability and Statistical Inference I	
or 21-325	Probability	
or 21-425	Probability and Martingales	
73-265	Economics and Data Science	9
73-274	Econometrics I	9
73-374	Econometrics II	9

Mathematical Sciences Requirements

21-120	Differential and Integral Calculus	Units
or 21-111 & 21-112	Differential Calculus and Integral Calculus	10-20
21-122	Integration and Approximation	10
21-127	Concepts of Mathematics	12
or 21-128	Mathematical Concepts and Proofs	
21-228	Discrete Mathematics	9-12
or 15-251	Great Ideas in Theoretical Computer Science	
21-241	Matrices and Linear Transformations	11
21-259	Calculus in Three Dimensions	9-12
or 21-256	Multivariate Analysis	
or 21-266	Vector Calculus using Matrix Algebra	
or 21-268	Multidimensional Calculus	
or 21-269	Vector Analysis	
21-260	Differential Equations	9
21-355	Principles of Real Analysis I	9
21-356	Principles of Real Analysis II	9

Programming Requirement (10 Units)

15-110	Principles of Computing	Units
		10

- or 15-104 Introduction to Computing for Creative Practice
- or 15-112 Fundamentals of Programming and Computer Science
- or 02-120 Programming for Scientists

Writing Requirement

70-340	Business Communications	Units
		9

Economics Electives (27 Units)

Students must take three economics elective courses. Economics elective courses are those courses numbered 73-300 or higher, (excluding 73-374 Econometrics II). Students are encouraged to work with their advisors to structure a set of courses which meet these requirements based on their particular interests, subject to course availability.

Recommended Economics electives include: 73-315 Market Design, 73-347 Game Theory Applications for Economics and Business, 73-365 Firms, Market Structures, and Strategy, and 73-421 Emerging Markets.

Mathematical Sciences Electives (27 Units)

Students must take three advanced mathematics depth courses. Students are encouraged to work with their advisors to structure a set of courses which meet these requirements based on their particular interests, subject to course availability.

Recommended Mathematical Sciences Depth Electives:

21-270	Introduction to Mathematical Finance	9
21-292	Operations Research I	9
21-301	Combinatorics	9
21-341	Linear Algebra	9
21-369	Numerical Methods	12
21-370	Discrete Time Finance	9
21-371	Functions of a Complex Variable	9
21-393	Operations Research II	9
21-420	Continuous-Time Finance	9
21-484	Graph Theory	9

Senior Work

73-497	Senior Project	12
or 73-500 & 73-501	Tepper College Honors Thesis I and Tepper College Honors Thesis II	

Note: Students in the B.S. in Mathematical Sciences and Economics who complete an Honors Thesis in economics may use 73-497 (Senior Project) as an economics elective.

Double-Counting Restriction

The 3 economics electives and 3 Mathematical Sciences electives cannot double count with another major or minor.